

Name:

Period:

Honors and Conceptual Physics: HW: Friction II

Alexis and Marco are fighting over a box of chocolates sitting on a level table. Alexis is pulling the box of chocolates to the right with a force of 8N. Marco is pulling the box to the left with a force of 7.5N. The box of chocolates has a mass of 0.2 kg, a coefficient of friction of 0.2, and is sliding to the right.

1. Draw a **free body diagram** of the box of chocolates. Remember to include **all** forces exerted on the box. You may have to come back and add magnitudes to this after completing other parts.
2. What is the normal force on this box? **Add this to your free body diagram.**
3. What *kind* of friction is acting on this box: kinetic or static?
4. Calculate the magnitude of the friction on the box. Which way is it? **Make sure this force is on your free body diagram.**
5. What is the **net force** acting on this box? **Which way?**

6. What is the acceleration of this box? Which way?
7. To pull a wagon across a lawn with constant velocity, you have to exert a steady force. But Newton's First Law says that motion with a constant velocity requires no force. Explain this apparent contradiction.
8. When your car moves along the highway at a constant velocity, the net force on it is zero. Why, then, do you have to keep running the engine?
9. Which takes less force: to make a stationary dresser start sliding across the floor, or to keep that dresser sliding at a constant velocity? Explain.
10. A large box is sliding fast to the left and is about to hit a puppy. You jump in front of it and push it to the right to try to make it stop. In which direction is the force of friction between the box and the floor?

